Innovative thinking

Greg Harasen

The veterinary orthopedic world lost a major figure last spring when Dr. Barclay Slocum died of cancer in Eugene, Oregon. Dr. Slocum was one of those individuals who thought "outside the box," and stimulated many significant developments in small animal orthopedics.

Among his innovations was the trochlear wedge recession technique for stabilizing luxating patellas (1). Previously, shallow trochlear grooves were deepened by "rongeuring" away the articular cartilage. Morbidity was high and the quality of the fibrocartilage that formed after the trochlear sulcoplasty was often poor. Slocum's solution was to cut a V-shaped wedge from the trochlear groove, deepen the resulting defect, and then replace the cartilage-bone wedge to produce a deeper trochlear groove while preserving the articular cartilage. This ingenious approach still represents the standard of care for treating luxating patellas 16 y after the publication of Slocum's landmark paper (1). He also demonstrated that the depth of the trochlear wedge should be equal to the width of the saw cut multiplied by the cosine of the angle of the trochlear wedge apex, divided by 2, and then divided by the sine of the angle of the wedge's apex. Talk about thinking outside the box!

Slocum lent his hand to the problem of canine hip dysplasia when he was the first to suggest splitting the femur sagittally distad from the trochanteric fossa and inserting plastic wedges into the sagittal cut, effectively "lengthening" the femoral neck. His femoral neck lengthening osteotomy seated the femoral head more deeply into the acetabulum (2).

Slocum's modification and marketing of his triple pelvic osteotomy plates have had a significant impact on the surgical treatment of dysplastic young dogs.

Arguably, Slocum's greatest, and certainly the most controversial, impact on small animal orthopedics is his approach to cranial cruciate ligament (CCL) rupture in the dog. In a 1983 paper, he described cranial tibial thrust as a force vector directed craniodistad along the top of the tibial plateau in the stifle of the standing dog. The cranial cruciate ligament was identified as a passive restraint of this force vector and he postulated that this might play a role in the pathophysiology of cruciate rupture (3). The challenge was to devise a way to surgically counteract the cranial tibial thrust in the CCL deficient patient. Slocum's initial solution was to perform a closing wedge transverse osteotomy in the cranial aspect of the proximal third of the tibia, stabilized by a bone plate. The attempt was to "level" the tibial plateau in the standing animal, thus neutralizing the cranial tibial thrust force vector (4). Slocum's refinement of the technique became known as the tibial plateau leveling osteotomy (TPLO) (5,6). Then the controversy started! Slocum patented the procedure and the equipment used in performing it. He was accused of providing few details and clinical results in his lectures and publications on the subject. The TPLO procedure was taught out of his practice and, up to the time of his death, the waiting list to take the course was long. Tibial plateau leveling osteotomy graduates were prohibited from teaching the technique to others and formed a ready market for TPLO plates and surgical equipment designed by Slocum.

The whole notion of bypassing the traditional route of sharing scientific knowledge with and having it scrutinized by one's colleagues rubbed many the wrong way. Others applauded his efforts to benefit financially from his own innovations.

My lasting impression of Slocum will be from the 1996 meeting of the American College of Veterinary Surgeons: he found himself on a panel with Dr. Gail Smith from the University of Pennsylvania, who has pioneered, published, and lectured extensively on the fibular head transposition technique for cruciate repair, and Dr. Don Hulse from Texas A&M University, who has been a strong proponent of the intracapsular approach to cruciate ligament. The 3 engaged in an exchange of very frank views on the management of cruciate disease. The atmosphere was electric and Slocum gave as good as he got!

The most recent meeting of the Veterinary Orthopedic Society featured a round-table discussion of the TPLO, which generated both heat and light! The conclusion was that the procedure seems to work, but more investigation is needed. Recently published data have shown that there does not appear to be any significant difference in the tibial plateau angle between dogs that tear their cruciate ligaments and those that don't (7). The tibial plateau may actually be parallel to the ground in the standing animal when the normal standing joint angles are all considered (7), and it could be that what the TPLO actually does is to rotate the proximal one-third of the tibia in such a manner that the caudal cruciate ligament becomes the restraint on cranial drawer motion that the CCL was in the healthy stifle. This may make the caudal cruciate ligament subject to failure with time (8).

As always, Barclay Slocum has us thinking!

Animal Clinic of Regina, 1800 Garnet Street, Regina, Saskatchewan S4T 2Z2.

References

1. Slocum B, Devine T. Trochlear recession for correction of luxating patella in the dog. J Am Vet Med Assoc 1985;186:365–369.

2. Slocum B, Devine T. Cranial tibial thrust: a primary force in the canine stifle. J Am Vet Med Assoc 1983;183:456–459.
3. Slocum B, Devine T. Cranial tibial wedge osteotomy: a technique for eliminating cranial tibial thrust in cranial cruciate ligament repair. J Am Vet Med Assoc 1984;184:564–569.
4. Slocum B, Devine T. Femoral neck lengthening for hip dysplasia in the dog. Vet Surg 1989;18:81.
5. Slocum B. Tibial plateau leveling osteotomy for repair of cranial cruciate ligament rupture in the canine. In: Roush JK, ed. Vet Clin North Am Small Anim Pract. Philadelphia: WB Saunders Co, 1993;23:777–795.
6. Slocum B, Devine T. Tibial plateau leveling osteotomy. Proc Annu Meet Am Coll Vet Surg, 1996:114–115.
7. Wilke VL, Conzemius MG, Benson T, Besancon M. Tibial plateau angle with respect to the ground in the normal labrador retriever and greyhound. Proc Annu Meet Vet Ortho Soc, 2001:7.
8. Reif U, Hulse DA, Hauptman JG. Effect of tibial plateau leveling osteotomy on joint stability in the canine cranial cruciate deficient stifle under axial tibial load: an in vitro study. Proc Annu Meet Vet Ortho Soc, 2000:41.

Books Received

Through the generosity of several book publishers, the ***Canadian Veterinary Journal*** *is able to inform readers of new publications that are now available to veterinary practitioners. Readers are invited to contact their local library, the publishers listed here, or the bookstores of Canadian veterinary colleges should they wish to obtain their own copies.*

- Keeling LJ, Gonyou HW, eds. ***Social Behaviour in Farm Animals.*** CABI Publishing, Oxford, 2001, 406 pp, ISBN 0-85199-397-4, US$110.
- Kinkade A. ***Straight from the Horse's Mouth.*** Random House of Canada, Mississauga, 2001, 266 pp, ISBN 0-609-60769-3, CDN$33.
- Lifelearn. ***Upper GI Endoscopy.*** Lifelearn, Guelph, 2000, ISBN 1-8969-8536-X, CDN$129.
- Harvey RG, Harari J, Delauch AJ. ***Ear Diseases of the Dog and Cat.*** Iowa State University Press, Ames, 2001, 320 pp, ISBN 0-8138-0302-0, US$79.95.
- Stowe JD. ***Effective Veterinary Pracitice.*** Lifelearn, Guelph, 2001, 412 pp, ISBN 1-8969-8505-X, CDN$99.
- Fowler ME, Cubas ZS, eds. ***Biology, Medicine, and Surgery of South American Wild Animals.*** Iowa State University Press, Ames, 2001, 536 pp, ISBN 0-8138-2846-5, US$89.95.
- Bower J, Griper J, Gripper P, Gunn D. ***Veterinary Practice Management, 3rd ed.*** Iowa State University Press, Ames, 2001, 264 pp, ISBN 0-6320-5745-9, US$47.95.
- Lifelearn. ***Understanding Heartworm Infection.*** Lifelearn, Guelph, 2001, ISBN 1-896985-16-5, CDN$99.
- Ramsey I, Tennant B, eds. ***Manual of Canine and Feline Infectious Diseases.*** British Small Animal Veterinary Association, Gloucester, 2001, 288 pp, ISBN 0-905214-53-6, £84.
- Gurney C. ***The Language of Animals.*** Random House of Canada, Mississauga, 2001, 244 pp, ISBN 0-440-50912-2, CDN$19.95.

Livres reçus

Grâce à la générosité d'un grand nombre d'éditeurs, la ***Revue vétérinaire canadienne*** est en mesure de tenir ses lecteurs au courant des nouvelles publications rendues disponibles aux médecins vétérinaires. On encourage les lecteurs qui désirent obtenir une de ces publications à entrer en contact avec leur bibliothèque, avec les éditeurs listés ci-bas ou avec les librairies aux facultés de médecine vétérinaire.

- ***International Aquatic Animal Health Code, 4th ed.*** World Organization for Animal Health, Paris, 2001, 153 pp, ISBN 92-9044-541-6, 30 Euros.
- Burrows GE, Tyrl RJ. ***Toxic Plants of North America.*** Iowa State University Press, Ames, 2001, 1342 pp, ISBN 0-8138-2266-1, US$174.95.
- ***Manual of Standards for Diagnostic Tests and Vaccines, 4th ed.*** World Organization for Animal Health, Paris, 2001, 957 pp, ISBN 92-9044-510-6, 120 Euros.
- Dallas S. ***Animal Biology and Care.*** Iowa State University Press, Ames, 2000, 255 pp, ISBN 0-632-05054-3, US$26.95.
- Ritchie BW. ***Avian Viruses.*** Iowa State University Press, Ames, 2000, 540 pp, ISBN 0-9636996-3-6, US$74.95.
- American Animal Hospital Association. ***OSHA Compliance and Safety Guide for Veterinary Practice.*** Amboy Associates, San Diego, 2000, US$111.
- Holcombe SJ. ***Upper Airway Examination of the Performance Horse.*** Lifelearn, Guelph, 2000, CDN$99.
- Lifelearn Inc. and Animal Care Training. ***Safety in the Veterinary Practice.*** Lifelearn, Guelph, 2000.
- Tully TN, Mitchell MA. ***A Technician's Guide to Exotic Animal Care.*** American Animal Hospital Association, Denver, 2001, 247 pp, ISBN 1-58326-012-9.
- Edalati R. ***Barker's Grub.*** Random House of Canada Limited, Mississauga, 2001, 208 pp, ISBN 0-609-80442-1, CDN$18.